

GEORGIAN BAY
FOREVER



Community Engagement

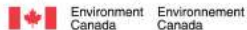
GEORGIAN BAY
FOREVER



Protecting your water.

Coastal Wetland Phragmites Eradication Project

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :



CANADA 150



Government Support



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Environment and
Climate Change Canada

Environnement et
Changement climatique Canada



Objectives

- Long term - Ultimate goal – eradicate *Phragmites* in Georgian Bay by engaging and training community champions, municipal governments, property owners and the public



Invasive *Phragmites*





Propogates rapidly

Spreads by:

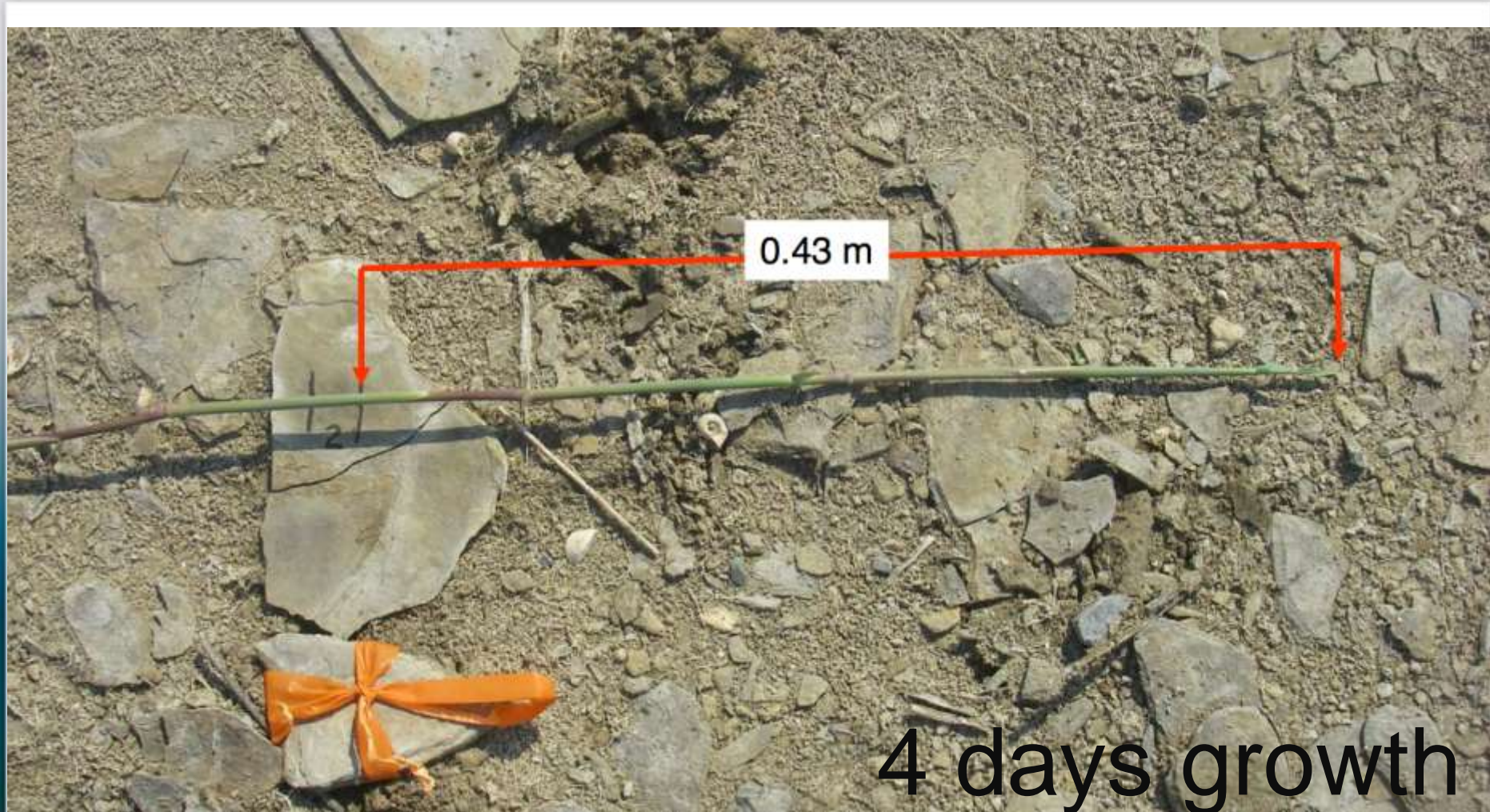
- Seeds – most new stands start this way (2000/head)
- Rhizomes – 39.8 cm (15.7 in) per year
- Stolons – 10.7 cm (4.25 in) per day



photo credit: David Sweetnam



Outgrows Native Plants



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Destroys infrastructure



photo credit: David Sweetnam



Costs taxpayers





Destroys biodiversity



Wetland **with** healthy biodiversity

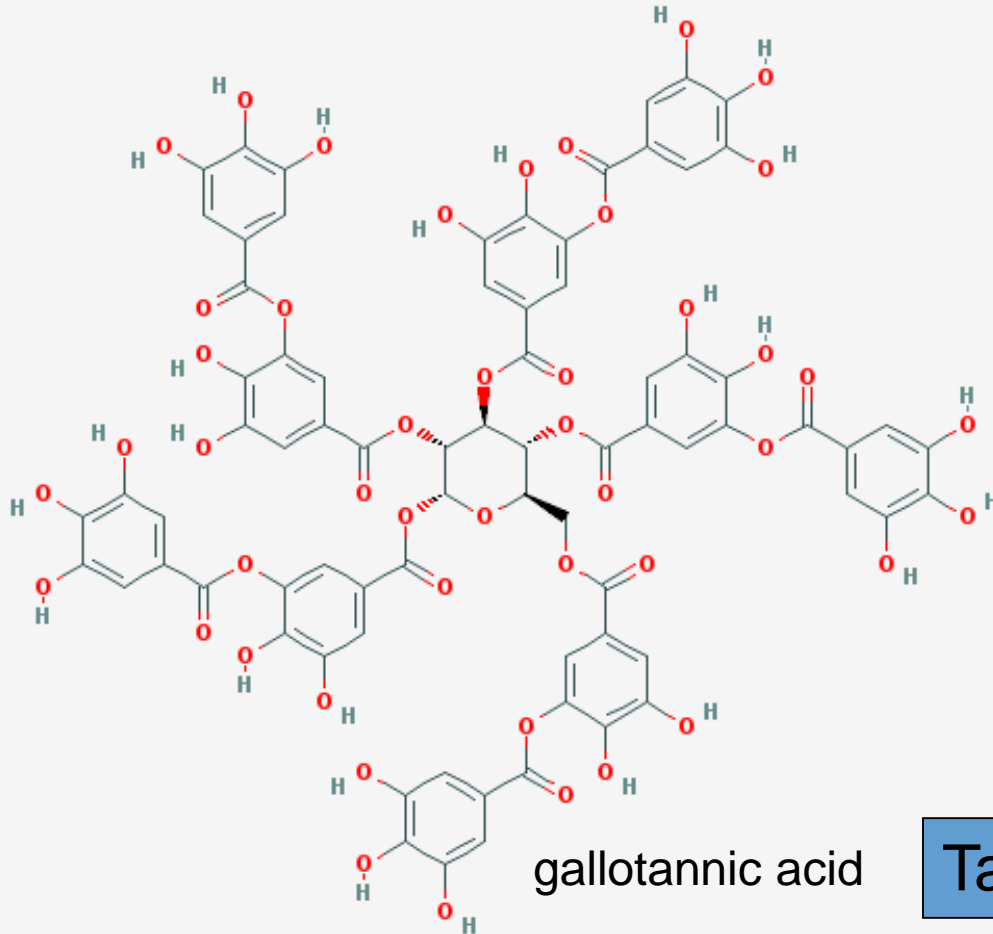
Invasive *Phragmites* is a nutrient bully and releases gallotannic acid from its roots that cause other plants to poison themselves



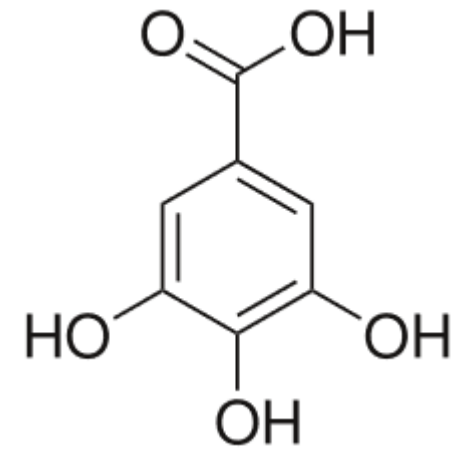
Wetland dominated by one plant



Biological warfare



Tannase



Root Growth Inhibitor



Phragmites snorkelling: how does it survive water level fluctuations?



¹Louise Aaen Jensen

¹Brian Sorrell

²Ole Pedersen

¹Hans Brix

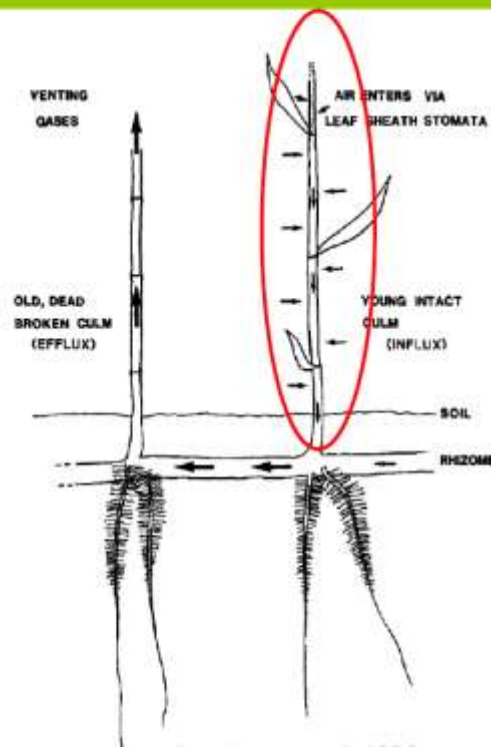
¹Department of
Bioscience, Aarhus
University

²Department of Biology,
Copenhagen University





Phragmites australis: Has pressurised convective gas flow in shoot & rhizome aerenchyma

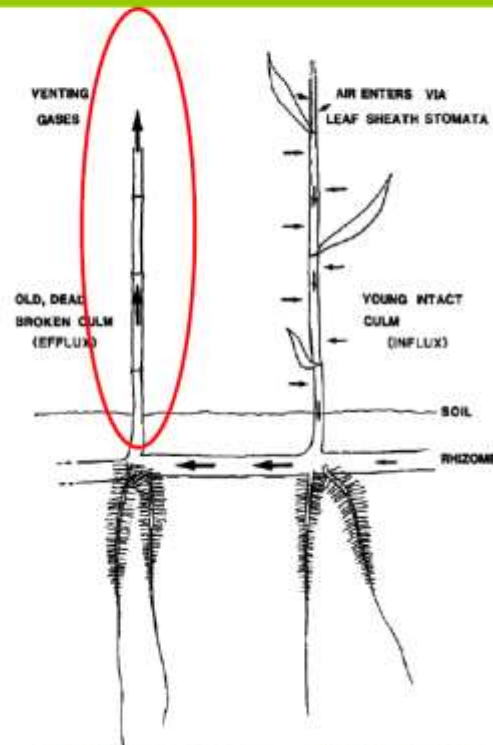


Armstrong et al. 1996

- Pressures are generated diurnally in live green shoots – “influx shoots”
- Pressurise due to humidity gradients driving air molecules into the **leaf sheath** airspaces via stomata.
- Pressurised gas in the leaf sheath enters the hollow stems at the nodes.



Phragmites australis: Has a humidity-induced convective gas flow in shoot aerenchyma



- Gas flows through rhizomes and ventilated to the atmosphere in old dead culms ("efflux culms").
- Very high internal oxygen fluxes c.f. simple diffusion.
- Beneficial for growth in deep water and maintaining high rhizome biomass.

(1) Pressures → (2) Flows → (3) Aeration (pO_2)



Opportunistic



Nottawasaga Bay. Photo Credit: Elaine Stephenson



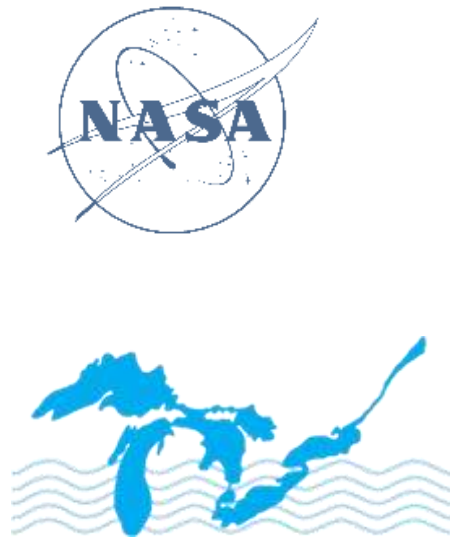
Opportunistic



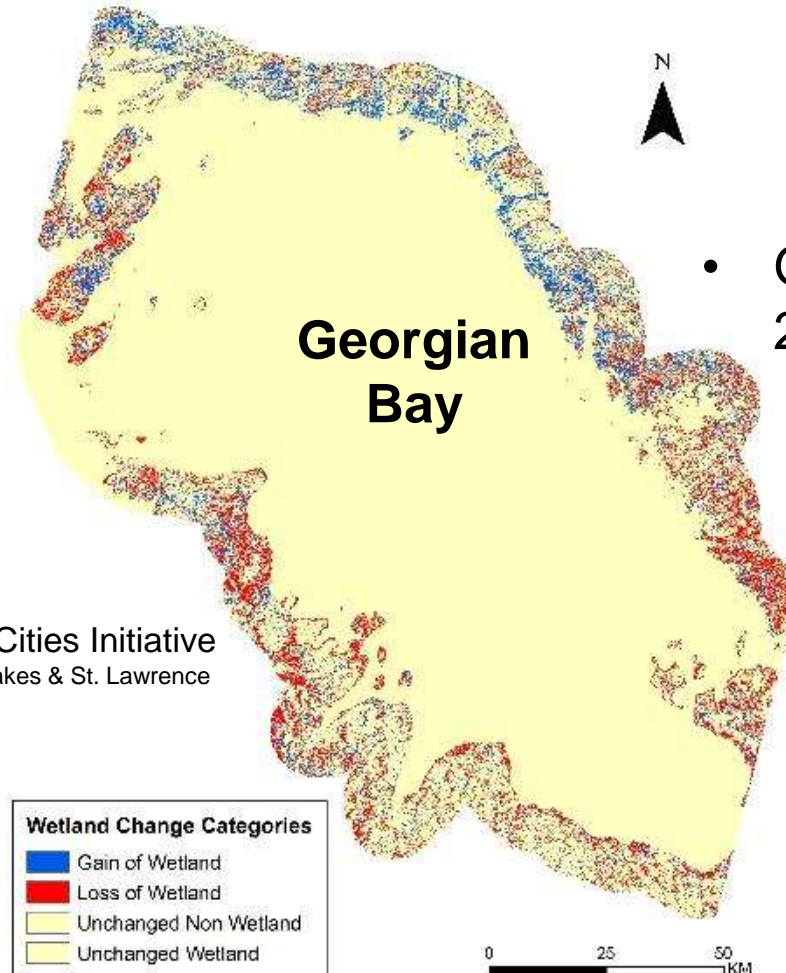


Climate Impacts

Wetland Extent Change 1987-2013



Great Lakes and St. Lawrence Cities Initiative
Mayors Protecting and Restoring the Great Lakes & St. Lawrence
River



- Georgian Bay: 1987-2013
 - 7% Wetland Gain in North
 - 10.8% Wetland Loss in South
 - net loss of 3.8%



Destroys Habitat





Destroys Habitat



Threatened

David M. Gosseligne

Photo Credit: Brittany Snow, NVCA



No predators





Control Options



Control Options

- Biological
 - Grazing – cattle, sheep, goats
 - Other Herbivores - Moths
 - biotechnology
- Mechanical
 - Smothering, Drowning, Plowing, Cutting, Burning
- Chemical
 - Spraying, Injecting, Wicking





Control Options

Mechanical

➤ Cutting



P. Cloud



J.M. Gilbert



Control Options



The rhizome remnants are like empty skins. They have no internal substance and are not showing signs of viability but are still present. This supports the withering of the rhizomes with persistent cutting but interesting that they are still partially there!



Control Options

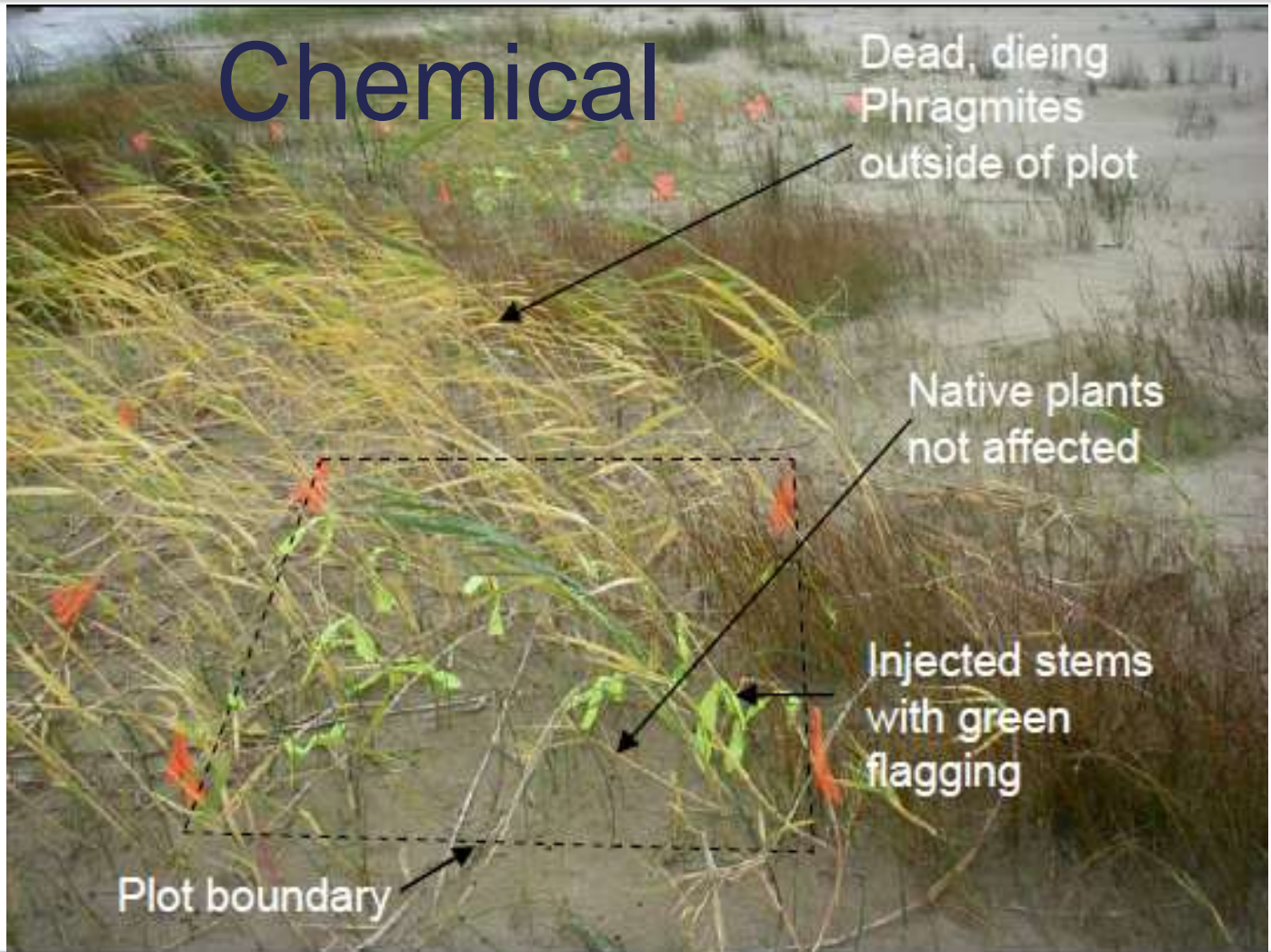


The lake level is rising and eroding the sand, exposing the roots and rhizomes. These are some of the exposed rhizomes (note the growth from the rhizome on the photo on the left) in front of a property with some *Phragmites* growing.



Control Options

Chemical





Roadside Ditches

MTO

Western Region 2015/16

Central Region 2016



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Partners







Municipalities





Communities





Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication

Pointe au Baril



Heather Sargeant

Collingwood



Georgian Bay Forever Photos

Cognashene



David Sweetnam

Woods Bay



Georgian Bay Forever Photos



Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication

Wymbolwood Beach





Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication






Invasive Phragmites Research

Researching the effectiveness of management techniques for controlling invasive Phragmites is incredibly important given the huge amount of money spent annually on trying to eradicate this invasive plant. It is estimated that current cost of control projects in Ontario ranges between \$865 and \$1,112 per hectare (Ontario's Biodiversity Strategy, 2012) and that land managers in the United States spend over \$4.6 million per year restoring habitats impacted by Phragmites (Hazelton et al., 2014).

It is equally important to understand the effects of treatment. There are many methods of control. At Georgian Bay Forever, we work with communities in wetlands with a [selective cut method](#). There are no approved herbicides to use in and around water in Ontario; although there are legal options in the United States that are widely used to combat invasive Phragmites. At GBF, we want to protect the ecosystems, and feel it is critical to strive to find research, and support projects to further understand methods and their effects in order to "do the most good, with the least amount of harm".

Here is some research that we are following, as well as some results of project cuts that we have partnered on:

-  [Biological Impacts of *Phragmites australis* in a Great Lake Coastal Marsh: Mechanisms of invasion and effects on wetland avian communities, University of Waterloo](#)
-  [Crown Marsh Restoration Treatment Study, University of Waterloo](#)
-  [Phragmites Management in Collingwood, 2015 Summary Report, Nottawasaga Valley Conservation Authority and other partners including GBF](#)
-  [A Baseline and Standardized Method for Monitoring the Treatment of Invasive Phragmites, Michigan Tech Research Institute](#)
-  [Phragmites snorkeling: How does it survive water fluctuations? Department of Bioscience, Aarhus University and the Department of Biology, Copenhagen University](#)

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Over 12,000 Impressions

GEORGIAN BAY
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WINTER 2015
VOL. 6, ISSUE 1

Protecting your water.

WATER LEVELS, WATER QUALITY, ECOSYSTEMS AND INVASIVE SPECIES

VITAL SIGNS
IS BACK!
SEE PAGE 6
FOR DETAILS

PAGE 11

RECLAIMING OUR WATER FROM TAKING ACTION AGAINST A SILENT OCCUPATION

INSIDE:

KARA DEVELOP EXPLORES
GEORGIAN BAY USING KARA
EARTH OBSERVATIONS

PAGE 4

THE GENERATIONS
OF BALLASTS
ON THE BAY

PAGE 5

EXPLORED STRAT
FOR DEALING W/
WATER LEVELS ON

PAGE 10

GEORGIAN BAY
FOREVER



Protecting your water.

WATER LEVELS, WATER QUALITY, ECOSYSTEMS AND INVASIVE SPECIES

THE REED INVASION

Phragmites are out of control
— but our community can help

PAGE 8

INSIDE:

NEW FINDING: HOW
WATER LEVELS AFFECT RAIN

PAGE 4

A MAN KIDS
LOVE FOR
WATER LEVELS

PAGE 6

COULD BETTER
DATA HAVE
OUR WATER LEVELS?

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GEORGIAN BAY
FOREVER



FALL 2015
VOL. 6, ISSUE 2

Protecting your water.

WATER LEVELS, WATER QUALITY, ECOSYSTEMS AND INVASIVE SPECIES

ALSO INSIDE:

NEW GIP TRAIL
WILL BEA ON HIS
COMMITMENT
TO GEORGIAN BAY

PAGE 9

NEW FINESTRENGTH
OPTIONAL STUDY

PAGE 8

ANALYST BOB
TWENTY-THREE STUDY
THAT ASSESSED CHANGING
LOCATION'S

PAGE 8

2015 PROFILE
THE KILBY

PAGE 8

DEALING WITH PHRAGMITES

PAGE 4

Bay of Islands

McGregor Bay

Phragmites Activity

Place	Activity
Bay of Islands	Training/Education
Blackstone	Mapping
Cognashene	Educate/Cutting
Collingwood	Educate/Train/Cut
Go Home Bay	Training/Education
Greater Georgian Bay	Educate
Honey Harbour	Educate/Train/Cut
Manitou	Educate
McGregor Bay	Training/Education
Owen Sound	Training/Education
Parry Sound	Training/Education
Penetanguishene	Training/Education
Shebeshekong River	Cutting
Sturgeon Bay/Pointe Au Baril	Educate/Train/Cut
Victoria Harbour	Educate/Train/Cut
Woods Bay	Educate

Sturgeon Bay

Manitou

Shebeshekong

Blackstone

Woods Bay

Cognashene

Go Home Bay

Honey Harbour

Penetanguishene

Victoria Harbour

Owen Sound

Collingwood

Action Plan

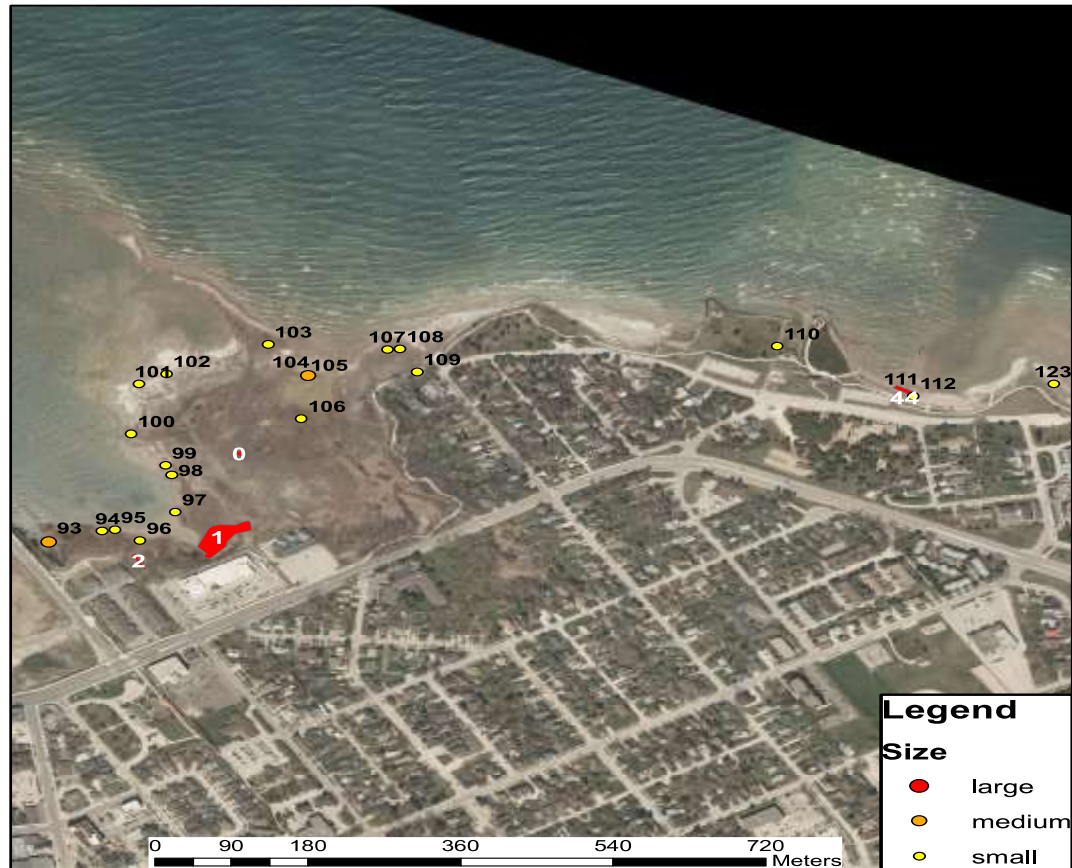
- Engage (Make the decision)
- Educate (Forums, workshops, web)
- Map (EDDMaps, community)
- Plan (small new stands, then mature)
- Cut (when ++ energy is out of the roots)
- Dispose (Municipal compost, burn)
- Monitor (Annual cuts and vigilance)



Mapping

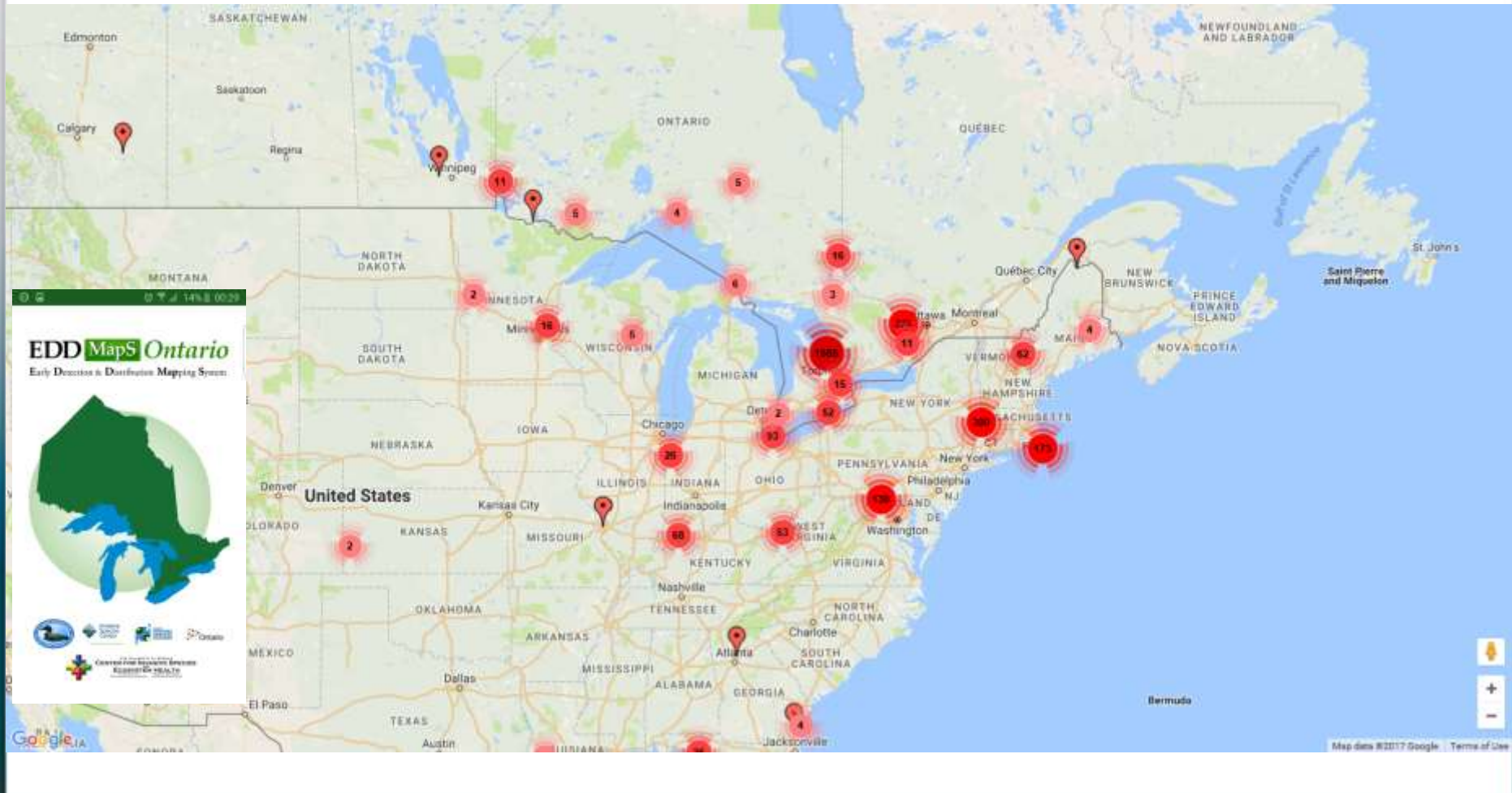


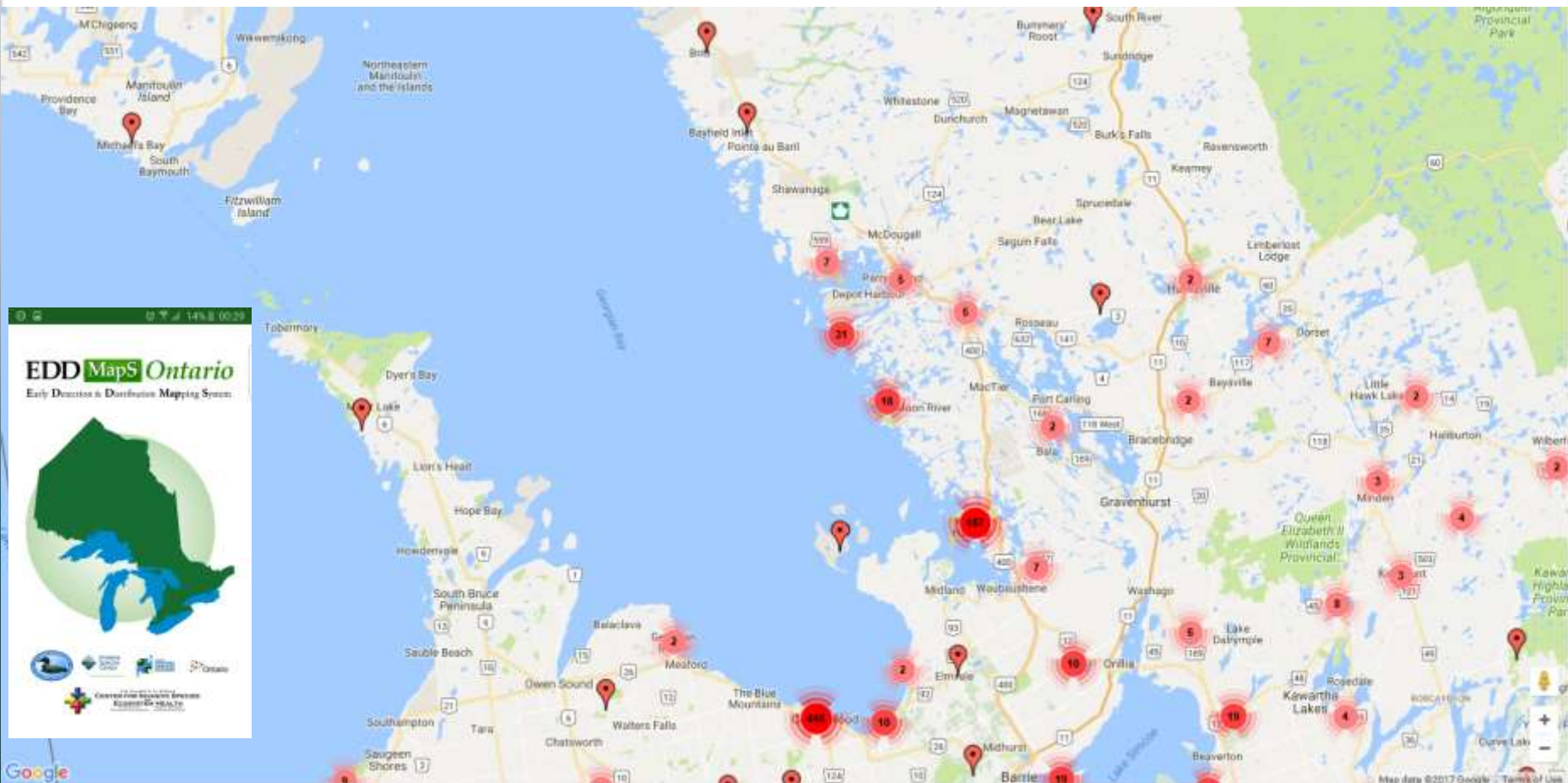
Sunset Point





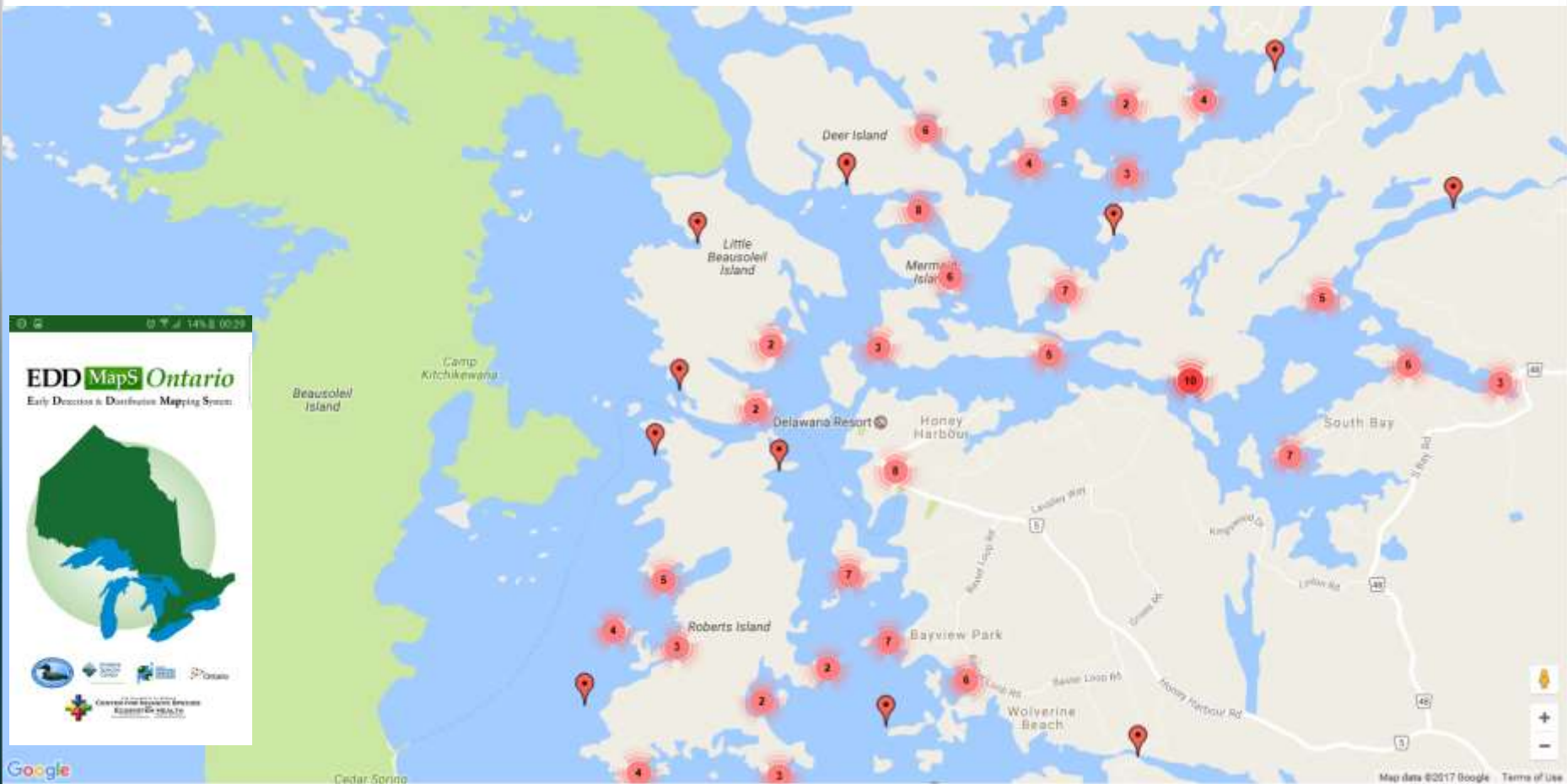
Mapping







North Bay/ South Bay



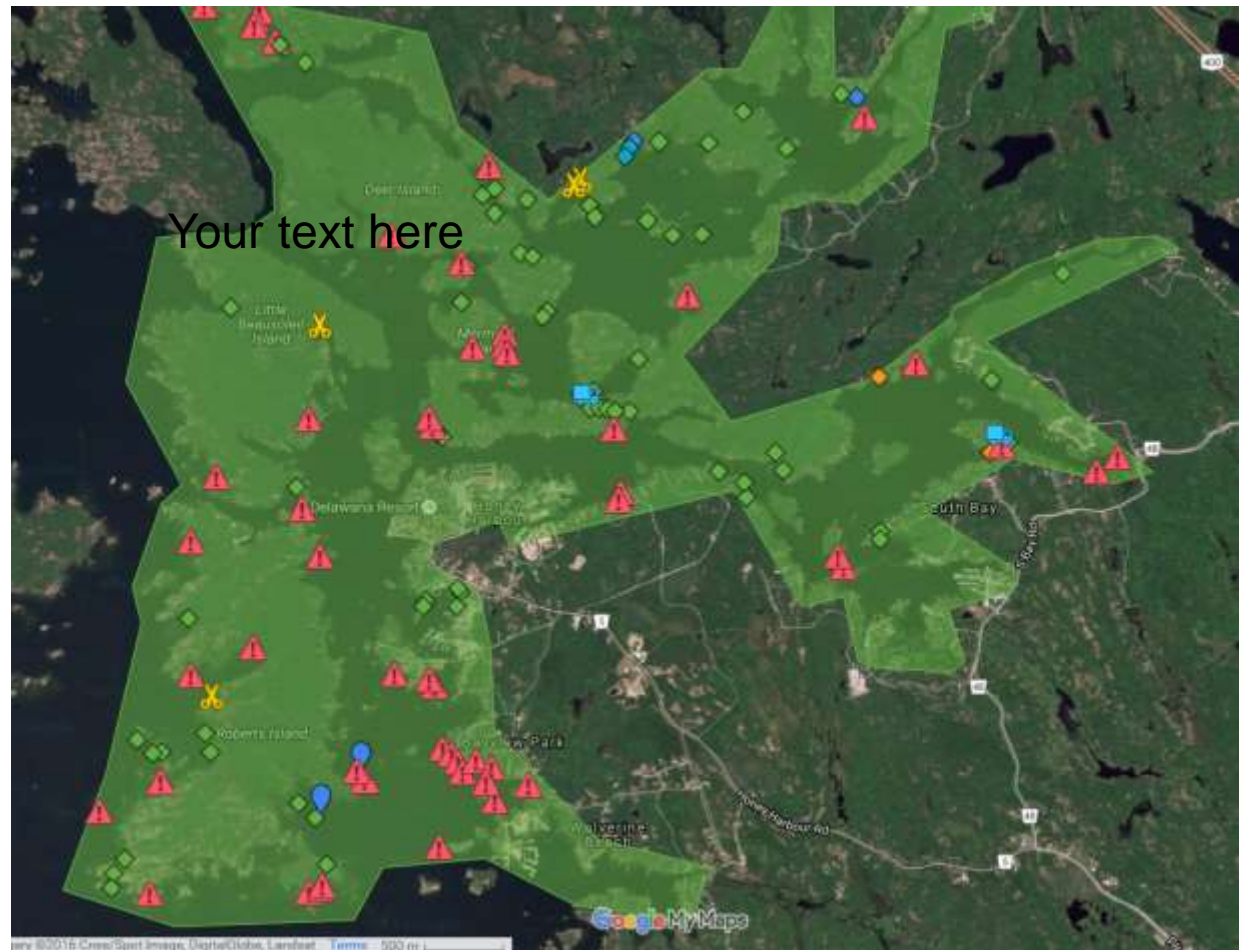


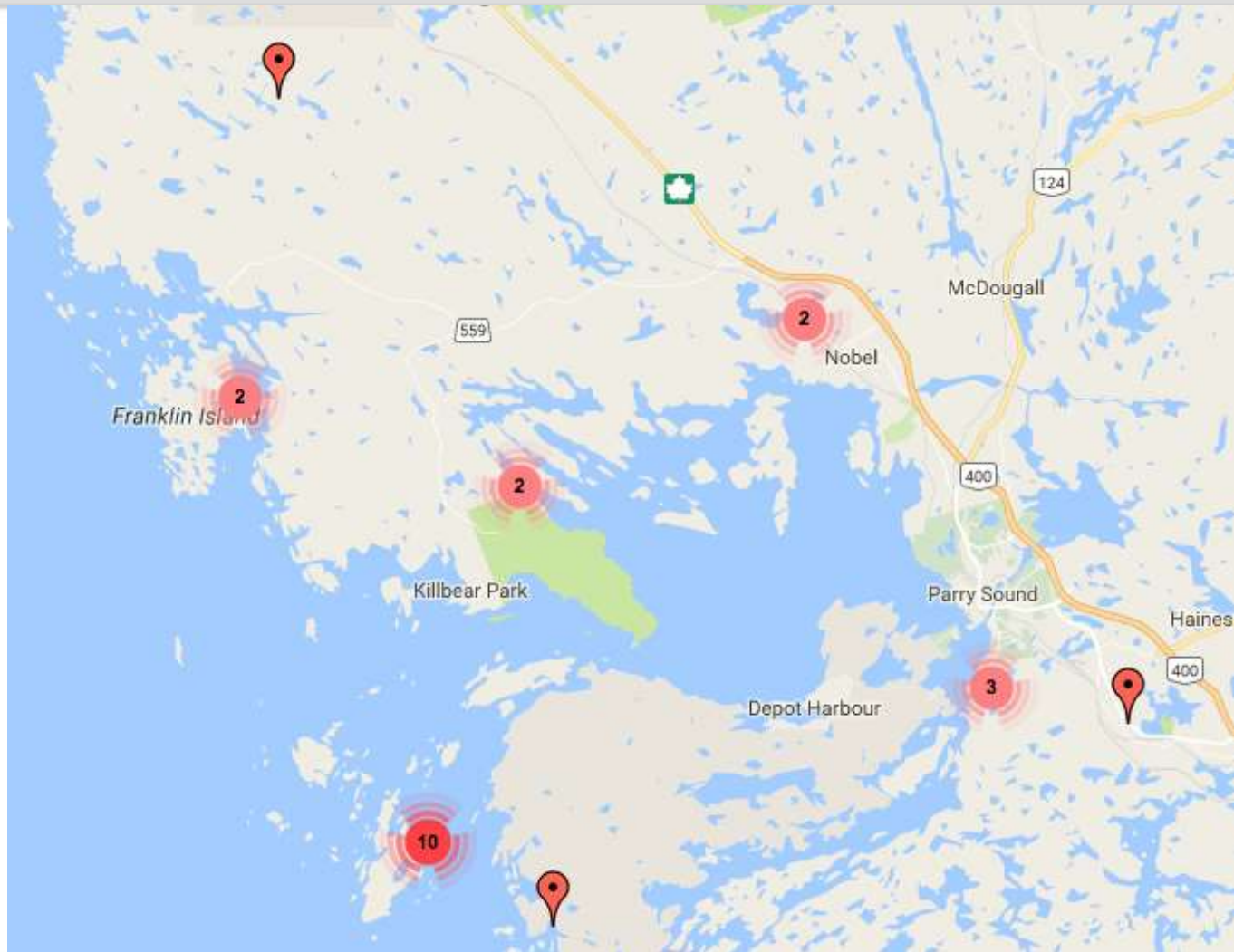
North Bay/ South Bay

140 sites identified

4 treated in 2015

40 treated in 2016







This is Woods
Bay and part of
Massassauga
Park

Circles were
tackled by the
community
group or
individual
landowners

The Park
Superintendent
now is now
looking into
purchasing a
cutter





Case Study

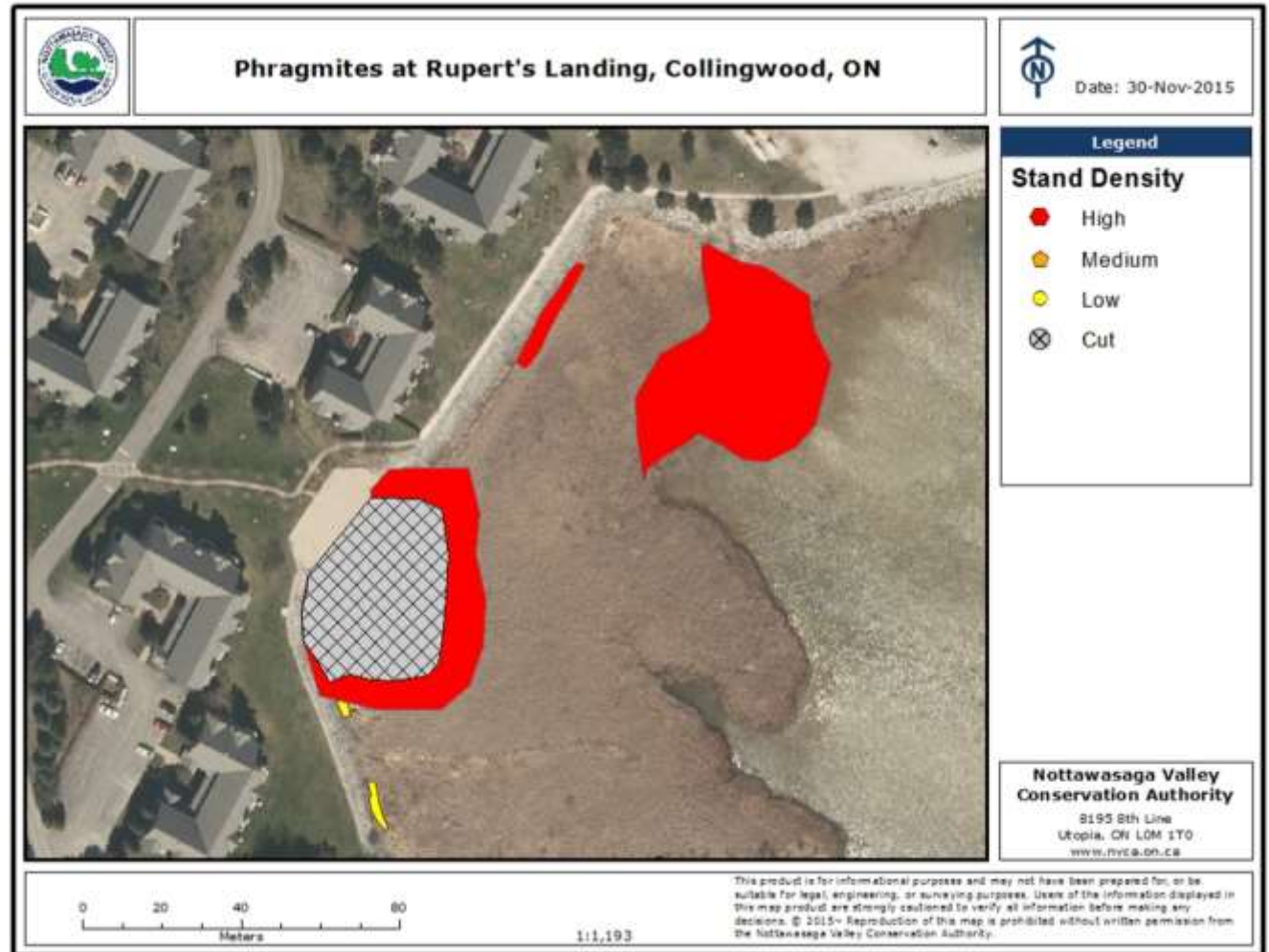


West Collingwood Density and size of Phragmites stands -

http://www.nvca.on.ca/Shared%20Documents/Phragmites_Management_in_Collingwood_Ontario_Report_2015.pdf



Case Study





Case Study



Photo Credit: David Sweetnam



Case Study



Photo Credit: David Sweetnam

GEORGIA
FORE



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2 Times
more in
2016





Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication





Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication

- It's tough work...but it works!



2013



2014



2015



Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication



Photo Credit: David Sweetnam



Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication



Photo Credit: David Sweetnam



Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication





Protecting Ecosystems

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Photo Credit: David Sweetnam



Protecting Ecosystems

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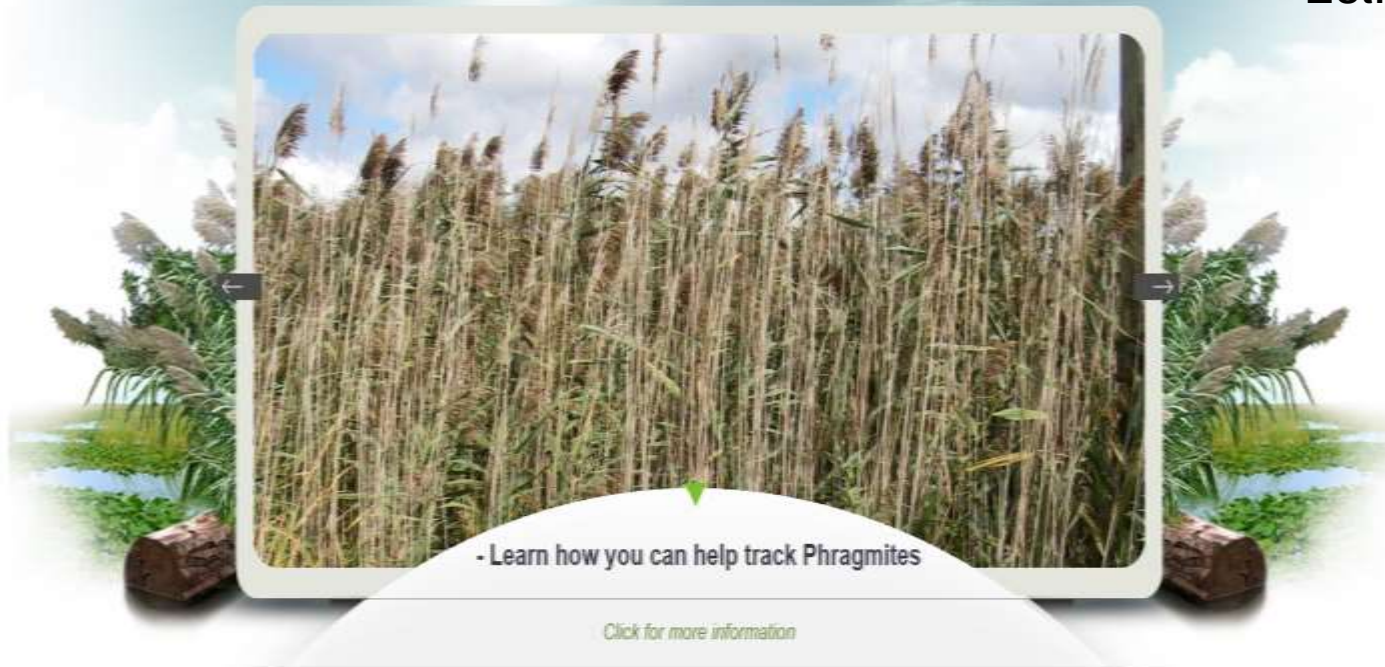
Protecting Ecosystems

Coastal Wetlands invasive Phragmites Eradication





Est. Dec. 2011



- For case studies, control information and other OPWG resources, please visit their website at www.opwg.ca



Questions?

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